DELTA WETLANDS PROJECT

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March 18, 2004

Mr. Jeremy Arrich
In-Delta Storage Program
Department of Water Resources, DPLA
P.O. Box 942836
Sacramento, CA 94236-0001

Re: In-Delta Storage Draft Summary Report Comments

Dear Mr. Arrich:

Delta Wetlands Properties (DW), as the owner of the Delta Wetlands Project (Project) currently under review by the CALFED Integrated Storage Investigation In-Delta Storage Program, offers the following comments on the *Draft Summary Report, In-Delta Storage Program, State Feasibility Study* (Report) dated January 2004, including all referenced technical reports and appendices.

The Report concludes that the Project is technically feasible and will provide significant statewide benefits. With water demand rapidly rising and regulatory/environmental constraints further straining existing water resources, California's elected officials, water industry, and business community have placed a high priority on expanding, improving, and better operating California's water infrastructure. Additional surface storage to create new water supply and efficiently store surpluses when available is critical to the state's continued economic viability. With the state's current fiscal constraints, this Project presents the California Bay-Delta Authority (CBDA) with its best opportunity to move beyond studies and actually implement a new surface storage project. As you are aware, all other projects currently under consideration are in the very early stages of investigation.

The Report lists a dozen benefits that contribute to each of CALFED's four objectives: water supply reliability, water quality, ecosystem restoration, and levee system integrity. In fact, it is the only project under consideration that can contribute to meeting all of CALFED's four primary objectives. According to the state feasibility study, the Project could provide:

- New Urban Supply
- New Agricultural Supply
- New CVPIA Level 4 Refuge Supply
- New Environmental Water Account (EWA) Supply
- New Ecosystem Restoration Program (ERP) Delta Flows
- Increased Operational Flexibility and Carryover Storage

- Water Quality (Salinity) Improvements
- Wildlife Habitat Improvements
- Interim Storage for Water Transfers
- Flood Damage Reduction
- Improved Levee (Seismic) Stability
- New Recreational Benefits

A great deal of technical work has been accomplished since the last ISI report was circulated for review and comment in May 2002. However, certain issues remain unresolved at this time, as is typical of any large project. Decision-makers need information that is complete, relevant, and sufficient to the decision being made. But, they do not need and can never obtain perfect information. We believe that the work undertaken to date on (1) the Delta Wetlands Environmental Impact Report, (2) the federal Biological Opinions and the state 2081 Incidental Take Statement, (3) the State Water Resources Control Board's proceedings and Decision 1643, (4) DW's Water Quality Management Plan (WQMP), (5) DW's agreements with California Urban Water Agencies, Contra Costa Water District and the East Bay Municipal Utility District, (6) the May 2002 ISI report and (7) this Report collectively provide more than enough support for proceeding with the Project's next steps.

GENERAL COMMENTS

We have provided below our general comments on the Report, organized by subject matter. Included in Attachment A of this letter are more specific comments, details and references in support of our general comments below.

Economic Analysis

The economic analysis presented in the Report is incomplete and should not be relied upon as a basis for future decision-making. Its assumptions are consistently conservative and serve only to establish a low-end range of benefits.

The economic analysis makes no attempt to quantify important benefits that are stated objectives of CALFED, including:

- Increased Operational Flexibility and Carryover Storage
- Water Quality (Salinity) Improvements
- Wildlife Habitat Improvements
- Interim Storage for Water Transfers

These benefit areas are precisely the benefits that are intended to distinguish CALFED surface storage projects from more traditional storage projects. If CALFED is serious about providing such non-traditional benefits, they must find a way to quantify them. Failure to do so puts all CALFED surface storage projects at risk. And, at this juncture, failure to quantify such benefits ultimately negatively and incorrectly impacts DWR's cost/benefit analysis for the Project.

The economic analysis inappropriately relies on Bulletin 160-98 for its demand and conservation assumptions. Bulletin 160-98 has been significantly criticized and is now hopelessly out of date. For example, the urban demands are based on regional population forecasts produced in 1993. Further, demand projections are for 2020 instead of 2030 as specified in CALFED's Common Assumptions. Bulletin 160-98 uses assumptions for the level of conservation that will be in place in 2020 that do not reflect decisions currently being made by responsible water agencies. The analysis assumes the implementation of all urban BMP's whether or not they are cost effective. This is not required by the Urban Best Management Practices MOU and is unlikely to occur. Cost assumptions for recycled water options are also more optimistic than more recent analyses. As such, Bulletin 160-98 provides an unrealistic set of planning assumptions that tend to understate urban water demand and Project benefits.

These deficiencies are important because the economic model is extremely sensitive to its assumptions. The defining inputs to LCPSIM are the level of urban demands, and the cost and volumes of supplies that could be used instead of new Project water supplies. None of these key inputs are known with certainty. As Appendix A to the Draft Report on Economic Analyses shows, changes in assumptions concerning the costs of alternative supplies can make significant changes in the water supply benefits of the Project. Comparison of Tables A.2 and A.5, shows that the estimated value of the project to Southern California urban users changes from $15 million to $27 million per year if the cost of its alternatives are increased by 50 percent. Similar analyses have not been conducted into the sensitivity of the results to water supply volumes or demand levels, but it seems clear that the modeling must be based on the best available information for these key variables. These assumptions must be carefully evaluated before the economic analysis can be finalized; therefore, the speedy development of defensible Common Assumptions for these factors is of utmost importance.

Finally, the economic analysis uses a cost of money that overstates what beneficiaries would actually pay. Using the model's assumed cost of money, the annual capital and operating cost of the project was estimated to be $60 million. But a more realistic cost of Project financing would reduce the annual capital and operating cost to less than $45 million. Beneficiaries would not be asked to pay the higher "societal" cost of money. This distinction is important for potential Project partners.

DWR concludes that additional work is required on the economic model. We agree. We believe that this is especially important because CALFED needs an economic analysis tool that is general and inclusive enough to provide a basis for comparing all CALFED storage projects. The economic model in its current state of development is not adequate to that task.

Water Quality

The water quality evaluations included in the Report are substantial and adequate for this level of feasibility analysis. The water quality evaluation considered dissolved organic carbon (DOC), salinity, temperature, and dissolved oxygen (DO) and concluded that the final operating criteria (FOC) of the biological opinions and the Water Quality Management Plan (WQMP) will protect the water quality of the Delta. The Report goes on to identify several operational strategies (e.g., circulation) to maximize project benefits while meeting FOC and WQMP requirements.

The DOC modeling assumptions included in the water quality modeling are unreasonably conservative and rely on unsupportable data. Assumed DOC loading rates for the reservoir islands are an order of magnitude higher than agricultural and wetland loading elsewhere in the Delta. DOC levels predicted for the reservoir islands reach levels that exceed levels found anywhere in the world (e.g., 350 mg/l). At best, this analysis shows the ability of the Project to accommodate DOC loading rates that are nearly ten times the loading rates from the existing agricultural operations. Even at the upper bound, the impact on Project operations is small which establishes the limit of financial risk associated with DOC management.

The Science Panel has reviewed the water quality analysis and has expressed no opinion regarding appropriate DOC loading rates citing a lack of understanding of underlying DOC generating mechanisms. They have recommended additional study to fill this void.

But, science in this area is not well developed and further studies to clarify DOC loading will continue to be problematic. Even after expending significant money and time for further studies, it is very likely that the results will continue to be imprecise. Given the low sensitivity of the Project to DOC loading rates, additional studies and field investigations are not necessary. A more practicable approach may be to investigate mitigation measures to address a range of DOC loading rates and to establish the financial bounds for possible DOC risk management measures. Reservoir circulation is an excellent example of one such DOC mitigation measure.

Finally, the Report ignores the potential of the Project to provide salinity benefits. The current operating scenarios focus on water supply and environmental benefits. Decision 1643 and the WQMP criteria ensure that water quality in the Delta is not negatively impacted. However, opportunities for the Project to improve or protect water quality in the Delta are abundant. An

additional study should be conducted to evaluate the Project's capability to generate salinity benefits.

Conclusions

This Report is the first state feasibility report to be issued for a CALFED surface storage project. Comments on this Report are being considered at the same time that CALFED is considering the future direction of CALFED's surface storage program. As such, these comments unavoidably reflect on both the In-Delta Storage Program specifically and CALFED's surface storage projects generally. The decisions made now about how to evaluate surface storage projects are precedent setting and will establish the basis for evaluation and comparison of all CALFED surface storage projects.

It is important that CALFED recognize success and that successful completion of one milestone qualifies projects to proceed to the next. We believe that CALFED should authorize the In-Delta Storage Program to proceed with the completion of its additional environmental analyses and to develop the analytical tools necessary to evaluate the economics of all CALFED storage projects.

We appreciate the opportunity to provide these comments. We are available to meet and discuss the above issues in more detail at your earliest convenience. Please contact Andy Moran or me if you have any questions.

Sincerely,

David A. Forkel
Assistant General Manager
Delta Wetlands Project

Enclosures

cc: Patrick Wright, California Bay-Delta Authority
Lester Snow, California Department of Water Resources
Steve Roberts, California Department of Water Resources
Dan Skopec, Office of the Governor
California Bay-Delta Authority
Bay-Delta Public Advisory Committee
(All without enclosures)

ATTACHMENT A

SPECIFIC COMMENTS

Draft Executive Summary (DES)

1. **P. 4:** "Diversions to the reservoir islands would occur during high flow season, lowering flood levels in adjoining channels and reducing the risk of flooding to neighboring islands."

Comment: Although there are theoretical flood control benefits of reservoir island diversions, they may not be very significant. The diversion impacts to flood stage have not been analyzed in the DES, but any benefits will be short-lived because there is limited storage capacity on the reservoir islands. Far more significant are the flood control benefits associated with levee improvements. Strengthening an island in the Delta will directly protect habitat and infrastructure but will also have far reaching benefits throughout the Delta. Failed levees lead to open bodies of water (e.g., Frank's Tract, Mildred Island) that pose an enormous flood risk to neighboring islands and increase Delta salinity from seawater intrusion and mixing.

2. **P. 6-7:** "It should be noted that these estimates [of project benefits] are extremely sensitive to assumptions about the future cost and availability of regional water management options …" and "Before total project benefits and costs can be compared, value must be assigned to these benefits."

Comment: The DES cautions that the economic estimates are "extremely sensitive" to the future availability and cost of other water management options (e.g., conservation, recycling). In addition, many benefits of the Project have not yet been quantified. It should be emphasized in the DES that the assessment of project benefits is incomplete and that DWR intends further review of these assumptions before finalizing the economics analysis for all water storage projects.

3. **P. 11:** "Additional water quality field and modeling evaluations are necessary to refine project operations for organic carbon, dissolved oxygen and temperature."

Comment: The DES calls for additional water quality evaluations to determine project impacts on DOC, DO, and temperature. As noted in our cover letter, the current analyses are adequate to ensure water quality objectives can be met with no significant financial impacts on the Project.

Draft Summary Report (DSR)

4. **P. 8:** "Levees that fail can also threaten the [Delta] water quality …"

Comment: The threat to water quality in the Delta from levee failures and the resultant seawater intrusion is reduced by the Project in a number of ways. First, strengthening the levee embankments reduces the risk of levee failure. Second, having an in-Delta reservoir can assist in the management of a water quality problem after a levee failure on other Delta islands. If the reservoirs are empty, high salinity water can be pulled onto the islands and released later in the year. If the reservoirs are full, low salinity water can be released back into the Delta to improve in-Delta quality.

5. **P. 9:** "Subsequent CEQA/NEPA documents would be required because …" and "Future CEQA/NEPA evaluations will tier from …"

Comment: Several options for future environmental documentation are described in Chapter 8 of the DSR. The options include a "subsequent" CEQA/NEPA document and a "tiered" document, but they are just options at this time. Concluding that these types of documents will be required is inconsistent with the statements in Chapter 8 which describes several options but makes no conclusions. The text on page 9 should be revised from "would" and "will" to "may."

6. **P. 11:** "… water diversion for Bacon Island has been changed from Old River to Santa Fe Cut."

Comment: The Bacon Island discharge location on the south end of the island has been relocated by DWR from Middle River to Santa Fe Cut. This new location will place the Bacon Island discharges much closer to CCWD intakes in Rock Slough and on Old River and significantly increase the amount of Bacon Island water that reaches CCWD intakes. DWR should explain why the discharge was relocated and consider moving the facility back to Middle River.

7. **P. 17:** "The present study assumed 2020 level of development …"

Comment: The operational modeling criteria assume a 2020 level of development (LOD) in this Report. CALFED is using a 2030 LOD for planning purposes which will include increased population levels and greater demands for water. Higher demands will increase the water supply benefits of the Project. The DSR should reflect that the higher demands associated with 2030

population levels will increase the water supply benefits of the Project. Presumably, all projects will be evaluated using the same LOD assumption.

8. **P. 21:** "The In-Delta Storage Project could provide additional water for recharge to help control groundwater overdraft south of the Delta …"

Comment: The Project can provide new water to help alleviate the groundwater overdraft problems south of the Delta and in the San Joaquin Valley. The full benefits of overdraft protection have not been considered in the economic analysis of the Project.

9. **P. 25:** "When water is stored over peat soils, DOC growth occurs …"

Comment: The DOC growth rate included in the water quality modeling assumes a high value that is excessively conservative and inconsistent with observed data elsewhere in the Delta. The growth rates are based solely on the Davis tank studies and are an order of magnitude higher than past work. As indicated in DW correspondence of September 5, 2003, we believe the DOC growth rate assumptions generated by the mesocosm tank studies are unrealistic and inappropriate because they do not reflect anything close to a steady-state condition that could be expected on the reservoir islands. We believe the loading rates in the DSM2 model should be corrected to reflect more reasonable loading rate assumptions. At best, the current model runs provide a tool to help understand a worst-case operating scenario (e.g., initial reservoir start-up) as an upper bound to understand the financial risks associated with the DOC loading uncertainties. However, it is not appropriate to consider these high DOC loading assumptions as representative of long-term reservoir operations. Nor is it necessary to require additional studies of this issue since the Project has been shown it can operate even at the upper bounds of the DOC loading range. Also, a comparison of Project loading rate assumptions with the existing agricultural loading rates in the DSM2 DOC model will help demonstrate the excessively conservative approach in the current DOC analysis.

10. **P. 27: "**The weighted project yield (Table 3.2) with the FMWT impact is 20 taf less …"

Comment: The weighted project yield impact of 20 taf when the FMWT < 239 rules are applied is too high and should be verified. The reduction is both inconsistent with past modeling and illogical, considering the constraints associated with the FMWT are primarily a reduction in diversions during February and March. This impact may be overstated.

11. **P. 28:** "Results given in Table 3.2 indicate that impact of D1643 requirements on In-Delta storage water balance is in the order of about 100 taf."

Comment: The cost in water supply benefits associated with D1643 requirements should be put into context relative to other water projects under consideration by CALFED. Because of the advanced stage of the DW Project, operating criteria have been established that ensure the project will not have environmental impacts or adversely affect others. Other water supply projects will face similar rules in order to avoid or mitigate environmental impacts. DWR should explain that the water cost of environmental mitigation must apply to all water supply projects.

12. **P. 35-36:** 'Further studies emphasizing water quality improvements should be conducted to determine the extent to which In-Delta Storage can improve Delta water quality."

Comment: The Report acknowledges the potential of the Project to create salinity benefits in the Delta but does not include a salinity improvement study among the 10 evaluation scenarios. The release of low salinity water from an In-Delta Storage Project can help reduce salinity levels during the dry summer and fall months. In-Delta Storage can also be used to repel seawater in emergencies. To ensure a balanced solution that includes water quality improvement, this additional study should be quantified and considered in all future analyses.

13. **P. 51:** "The OC growth rates shown in Table 4.1 were used in the DSM2 model runs."

Comment: The 0.59 gC/m^2/day growth rate for August, September, and October is significantly higher than the loading rates of 0.22 and 0.42 gC/m^2/day from the mesocosm tank studies, as shown on Figure 4.6. Even though we believe these loading rates are unrealistic as discussed above, the assumed loading rates in the DSM2 model should be corrected to reflect the referenced study.

14. **P.51:** "… annual average areal loading rate of about 100 gC/m^2/yr."

Comment: The annual average loading rate of organic carbon (100 gC/m^2/yr) assumed in the DSM2 model is nearly an order of magnitude above other sources in the Delta, including agricultural drainage from the intensively farmed deep peat islands of the Delta. (See DW correspondence of September 5, 2003.) This assumed loading generates DOC concentrations in the model that are excessively conservative, bordering on illogical. DOC concentrations predicted for the reservoir islands reach levels that exceed concentrations found anywhere in the world (e.g., 350 mg/l). The extreme DOC loading assumptions do show the ability of the project to accommodate high DOC loading rates. Even at the unrealistic upper bound, the impact on project operations is small. This low sensitivity to DOC loading suggests that additional studies and field investigations are not necessary.

15. **P. 55:** "EC and DOC were simulated as a conservative constituent while in the Delta channels."

Comment: DOC was simulated in the DSM2 model as a conservative constituent while on the reservoirs and in the Delta channels. This is another example of the conservative nature of the DOC analysis since evidence exists to the contrary. During the January 15, 2003 CBDA Science "Brownbag," Dr. James Hollibaugh presented data that suggests there is DOC degradation in the Delta channels and throughout the water supply system.

16. **P. 73:** "Considering the simulation period of 16 years, this [temperature violations] can be attributed to inherent noise within the model."

Comment: The temperature violation identified in Table 4.17 are clearly the result of model noise since little or no reservoir discharges are occurring during the time periods of violations. For example, there were no releases from Bacon during the 2 degree violation on June 14, 1976. Therefore, the Project could not have caused the reported violation.

17. **P. 89:** "The schedule reflects total construction duration of 6 years …"

Comment: The Project can be constructed in less than six years. The reservoir islands contain large quantities of material that can be moved efficiently and inexpensively to the toe of the existing levee. The DW plan has been to use the material to create wide toe berms, buttress the existing levee and improve the landside factor of safety. The large toe berms provide a higher factor of safety than a uniform slope and allow a faster construction sequence by placing mass where it can improve the safety factor without waiting for full consolidation of the peat. The DW plan has been to place the fill in stages with time between stages to allow for strength gain and monitoring. The timeframe to place the fill for this method of construction should be considerably less than the six years assumed in the Report. A timeframe of 2 years to construct the embankments should be readily achievable with the DW planned method of construction.

18. **P. 99:** "these gas wells and the parcels on which they are situated may not be part of the land acquisition for the project."

Comment: There is an operating gas well on Webb Tract that will be part of the land acquisition for the Project.

19. **P. 101:** "… DWR acknowledges that additional input from economic experts and potential project participants is needed to refine this [economic] assessment."

Comment: As noted in our cover letter, the economic analysis presented in the Report is incomplete and should not be relied upon as a basis for future decision making. Its assumptions are consistently conservative and serve only to establish a low end range of benefits.

20. **P. 103:** "… the total capital costs amortized over a 50-year period with an assumed discount rate of 6%."

Comment: As noted in our cover letter, the annualized project cost is overstated because the assumed interest rate is too high.

21. **P. 106:** "… the necessary capacity and policies needed to move available supplies among urban users to mitigate any localized shortage-related impacts caused by disparities in supply availability are assumed to be in place in 2020."

Comment: The assumption that the necessary capacity and policies to freely move water around the state as needed by 2020 is very questionable. This assumption will bias the economic optimization process by making phantom water available and significantly undervalue the water supply benefits of a new water storage project. For example, in the Bay Area, water quality issues make full system interconnection prohibitively expensive.

22. **P. 106:** "The availability and cost of the local regional options and availability of local carryover storage were assumed."

Comment: The availability assumptions for local supply options may significantly bias the economic analysis because the local regional supply options are assumed to be available at a constant level every year (P. 9, Draft Report on Economic Analysis). The LCPSIM model will not capture the large costs and losses that can arise when local shortages occur in these regional supplies. For the South Coast Region, local droughts and regional shortages often occur independent of state-wide hydrology. This modeling bias will significantly understate the water supply benefits of the Project as well as any other new water supply.

23. **P. 111:** "These [groundwater recharge] deliveries are valued at the average alternative cost of agricultural groundwater pumping in San Joaquin Valley, about $55 per acre foot."

Comment: Placing a value on groundwater recharge equivalent to average pumping costs does not seem to appropriately value this benefit. This $55 assumption overlooks the long-term effect on already overdrafted groundwater basins. The short-term use of groundwater as an alternative water supply (as analyzed for this study) may have no significant effect on the groundwater supplies; however, over the 50-year life of the Project, this effect could be significant. The only way to address the groundwater overdraft problem is to either provide new water to agricultural users or

reduce the water demand (e.g., fallowing). In either case this benefit would be more than the $55 per acre foot assumption. So the benefit not addressed in this analysis is the long-term reduction in groundwater overdraft.

24. **P. 116:** "If the assumptions are unreasonably optimistic about cost and/or availability of the regional options, the value of the In-Delta Storage Project will be understated."

Comment: The point selected on the In-Delta benefits curve (green line) from Figure 7-3 represents the minimum water supply value of the Project. An increase in the price of regional water management options that causes a reduction in local options by 100 taf (blue line) will increase the water supply benefits of the Project by about $20 million per year. This high sensitivity to regional management options (e.g., conservation, recycling) is significant and must be considered in the final economic analysis.